

REMARKS

In the office action, the Examiner (1) objected to the inventor declaration; (2) objected to the manner trademarks are used in the specification; (3) objected to a typographical error in claim 10; (4) rejected claims 1, 2, 4, 11, 18-27, 29, and 31-33 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,960,198 issued to Roediger et al. ("Roediger") in view of an article entitled "Lifting the Lid" by Hughes ("Hughes"); (5) rejected claims 3 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Roediger in view of Hughes and further in view of U.S. Patent No. 6,006,033 issued to Heisch ("Heisch"); (6) rejected claims 5, 6, 8-10 and 12-17 under 35 U.S.C. § 103(a) as being unpatentable over Roediger in view of Hughes and further in view of U.S. Patent No. 6,754,890 issued to Berry et al. ("Berry"); (7) rejected claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Roediger in view of Hughes and further in view of U.S. Patent No. 5,784,554 issued to Hsiung ("Hsiung"); and (8) rejected claim 28 under 35 U.S.C. § 103(a) as being unpatentable over Roediger in view of Hughes and further in view of U.S. Patent No. 6,374,369 issued to O'Donnell ("O'Donnell"). Reconsideration and allowance of the application, as amended, are requested.

I. Objection to Inventor Declaration

A new declaration in compliance with 37 C.F.R. 1.67(a) is in the process of being executed by each of the inventors. It is expected that this declaration will be filed shortly. It is therefore requested that this objection be held in abeyance until the new declaration has been executed and is filed.

II. Objection to Specification

The Examiner objected to the manner of use of trademarks in the specification. The specification, as amended, uses generic terminology with the trademark and also capitalizes each mark. These objections to the specification should therefore be withdrawn.

III. Objection to Claim 10

The Examiner objected to a typographical error in claim 10. Claim 10 has been amended to change the word "calculated" to "calculate" to correct this obvious typographical error. The objection to claim 10 should accordingly be withdrawn.

IV. Claim Rejections Under § 103(a)

The Examiner rejected claims 1, 2, 4, 11, 18-27, 29, and 31-33 under 35 U.S.C. § 103(a) as being unpatentable over Roediger in view of Hughes.

Independent claim 1 is directed to a method for use in analyzing software behavior. The method features the steps of:

in a disk drive controller having a processor executing computer software stored in a memory communicating with the processor via a local bus, identifying computer executable program code that includes a set of computer executable program instructions for recording analytical data for at least a subset of the computer executable program code, the set of computer executable program instructions being disabled from executing; and

without halting execution of the computer executable program code, enabling execution of the set of computer executable program instructions.

The Examiner contends that Roediger discloses each of the elements of claim 1 except that the prescribed steps are carried out in a disk drive controller having a processor executing computer software stored in a memory communicating with the processor via a local bus. The Examiner states that "Hughes teaches the need to selectively trace code within a disk drive controller without significantly slowing or stopping the system (see, for example, "Full speed ahead" on pp. 1-2). Therefore, it would have been obvious to one of ordinary skill in the computer art at the time the invention was made to perform the method of Roediger within such a disk drive controller environment. One would be motivated to do so to apply a known runtime-controllable trace/profile system to eliminate bugs while avoiding potentially

disastrous consequences associated with slowing or stopping such a known controller system.”

These rejections are respectfully traversed. The Roediger and Hughes references are not properly combinable under §103(a) because the prior art does not in any way suggest the desirability of the combination. In particular, there is no teaching, suggestion or motivation to combine the software profiler of Roediger with the system on chip embedded trace of Hughes. In fact, Hughes *teaches away* from and discourages use of Roediger’s software profiler. Consequently, the combination of these references is therefore improper and the office action fails to make a prima facie case of obviousness.

Roediger discloses a profiling system that can enable and disable collection of profile data during execution of a computer program. Roediger discloses inserting instrumentation code blocks into the program, which collect profile data during execution of the program. During execution of the program by the processor, whenever an instrumentation code block is encountered in the program, a profiling control bit is tested. If the bit is set, the instrumentation code is executed. Therefore, execution of the portions of the program not including the instrumentation code blocks is interfered with every time an instrumentation code block is encountered by the processor.

Hughes discloses a debugging system for system on chips (SoCs) having a processor and other components. Hughes discloses use of SoCs with a hard disk drive controller, and states that for this application, the processor must be run at “full speed.” If the speed of the system is reduced, “the head will crash into the surface of the disk.” Therefore, Hughes states that “[t]o investigate these bugs, we need to run the processor at its normal speed, but find a way of recording its behavior to allow investigation later.” The debugging system accordingly disclosed by Hughes is an Embedded Trace Macrocell (EMT), which is very different from Roediger’s software profiler. Unlike

Roediger's profiler, Hughes' EMT does not modify any part of the software being debugged because, as noted above, the processor must be run at full or normal speed. Hughes, instead, simply connects the EMT to the processor output to observe processor activity without interrupting or interfering with the execution of software by the processor or affecting processor performance. The processor is thereby allowed to run at full or normal speed, which it must do to avoid "disastrous" consequences.

Hughes, therefore, teaches away from using any technique for observing processor behavior that interferes with or interrupts processor activity because the processor must be run at full or normal speed. One skilled in the art would not consider using the teachings of Roediger, which, as mentioned above, require inserting instrumentation code blocks into the program, which when encountered by the processor require the processor to perform a number of responsive steps including testing a profiling control bit, and if the bit is set, executing the instrumentation code before returning to the program. This apparent interference with the operation of the processor would discourage one of ordinary skill in the art from combining the teachings of the references in the manner suggested by the Examiner.

Therefore, the combination of Roediger and Hughes is improper, and the rejection of claims 1, 2, 4, 11, 18-27, 29, and 31-33 under 35 U.S.C. § 103(a) based on the combination of these references should be withdrawn. These claims include all the independent claims in the application (claims 1, 18, 20-26, and 31-33). The remaining rejected claims in the application all depend on these independent claims, and should also be allowed. The other cited references (Heisch, Berry, Hsiung and O'Donnell) do not cure the deficiencies of Hughes and Roediger.

Furthermore, claim 2, which depends on independent claim 1 specifies:

identifying an instruction in the computer executable program code that disables the set of computer executable program instructions from executing; and

causing a change to the computer executable program code to counter the effect of the instruction.

The Examiner contends that these steps are disclosed by Roediger in col. 6, lines 18-32. However, Roediger only discloses use of a profile control bit 11 to enable or disable execution of instrumentation code. The profile control bit 11 is shown in Fig. 1 of the reference as part of condition register 21. The control bit 11 is not an instruction in the computer executable program code that disables the set of computer executable program instructions from executing as specified in the claim. Additionally, changing the control bit 11 does not change to the computer executable program code to counter the effect of the instruction also as specified in claim 2. Claim 2 is therefore patentable over the combination of Roediger and Hughes for these additional reasons, as is claim 3, which depends on claims 2.

Claims 1-33 are pending in the present application. As the application is now believed to be in condition for allowance, issuance of a Notice of Allowance is respectfully requested.

The Commissioner is hereby authorized to charge any fee deficiency associated with this submission, or credit any overpayment to Deposit Account No. 08-0219.

Respectfully submitted,



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August 16, 2005